The Top 4 Reasons you may want to Conduct a PM Evaluation

Reason #1: Never thought about the impact a PM Evaluation would make on..

- Equipment Problems / Failures
- Production Throughput
- Safety and Environmental issues
- Maintenance Cost and Production Throughput (OEE, MTBF, MTBR)

Reason #2: Free up Maintenance Staff to perform Proactive Work

- Wrench-Time Increases (Hands on Tool Time conducting proactive work)
- Breakdowns takes away time to conduct PM and Corrective Work (Planned and Scheduled)

Reason #3: Take Operator Care to the next level

- Operators take pride in operating the equipment to specifications
- Operators stress goes down
- Operators inspect items which could cause Process and Asset Failures
- Minimize Process and Asset Failures

Reason #4: To Reduce Cost and thus ensure viability of a Plant or Site

- Total Production and Maintenance Cost for the site will be reduced through the reduction of equipment failures thus increasing OEE, Production throughput and Safety

<u>Preventive Maintenance</u> - Actions performed on a time-based or machine-run-based schedule that detect, preclude or mitigate degradation of a component or system with the aim of sustaining or extending its useful life through controlling degradation to an acceptable level through standardize inspections with measurable criteria. (Source: SMRP Metrics)

What Percent of your current PM Tasks add "No Value"?

"Adds NO VALUE" is defined as a PM Task that …
    … is not focused on Mitigation / Prevention or "early detection" of a specific Failure Mode

PM Evaluation / Optimization Results

PM Eval Recommendation	# of Tasks	% of Total Tasks	Labor Hrs. Represented
No Value – Delete Task	1,740	15.2%	1,832
Reassign to Lube Route	1,167	10.0%	3,980
Reassign to Operator Care	1,889	16.1%	4,987
Replace with PdM	1,983	17.3%	4,876
Re-Write Task	2,387	20.8%	11,043
Task is Good as Found	2,289	20%	3,923
Total PM Tasks	11,455	100%	30,641

What Percent of your current PM Tasks should be "Reassigned to a Lube Route"?

"Reassigned to a Lube Route" is when someone is performing a lubrication task such as change gear oil in a gearbox. Why not perform a visual a specific visual inspection of the gearbox as part of changing oil, an example would to add 3-4 visual inspection task to the same asset.
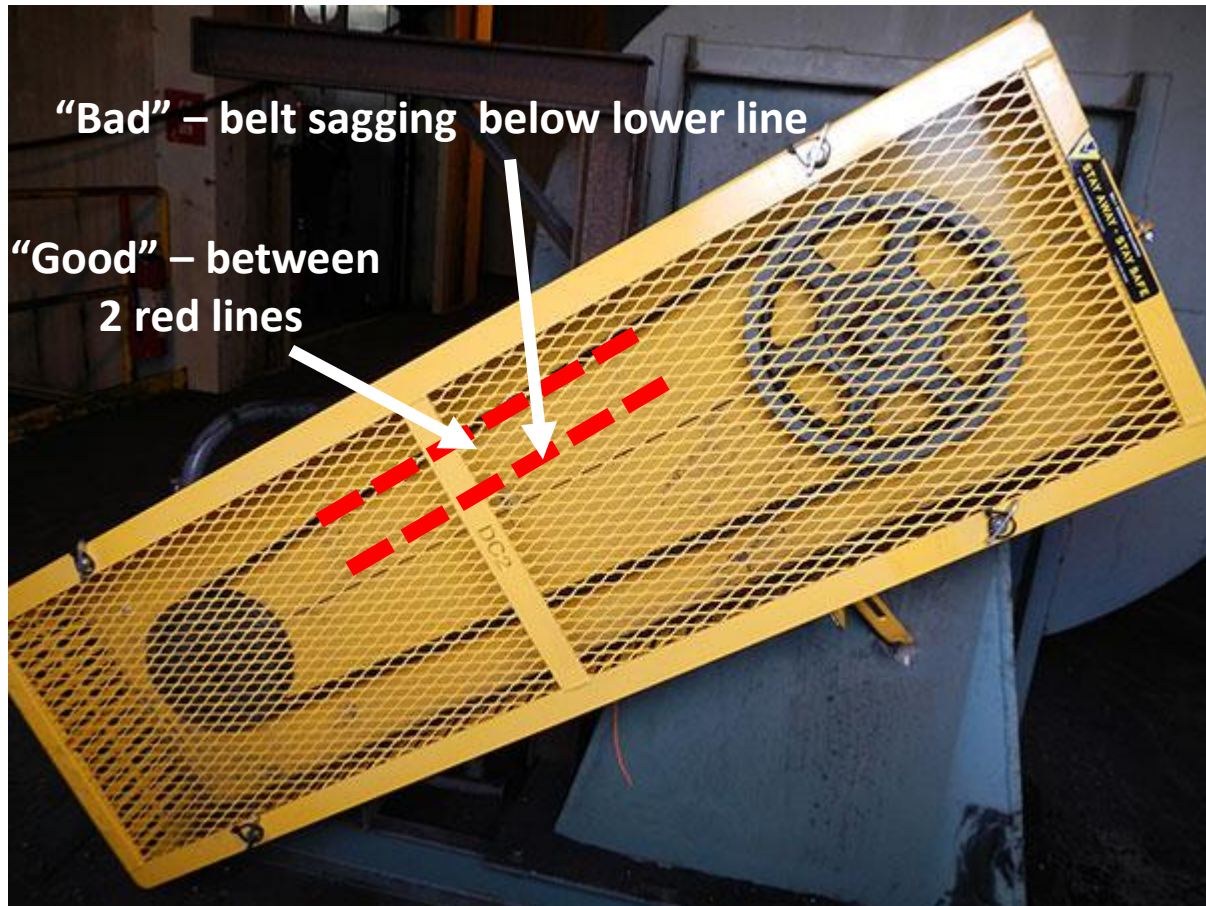
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What Percent of your current PM Tasks should be "Re-assigned to Operator Care"

"Reassigned to Operator Care" just makes sense, if an operator is visually inspecting an asset why not add a task such as "Check V-Belt Tension" or "Chain Sag" through visual aids?

"Bad" – belt sagging below lower line

"Good" – between 2 red lines

PM Evaluation / Optimization Results

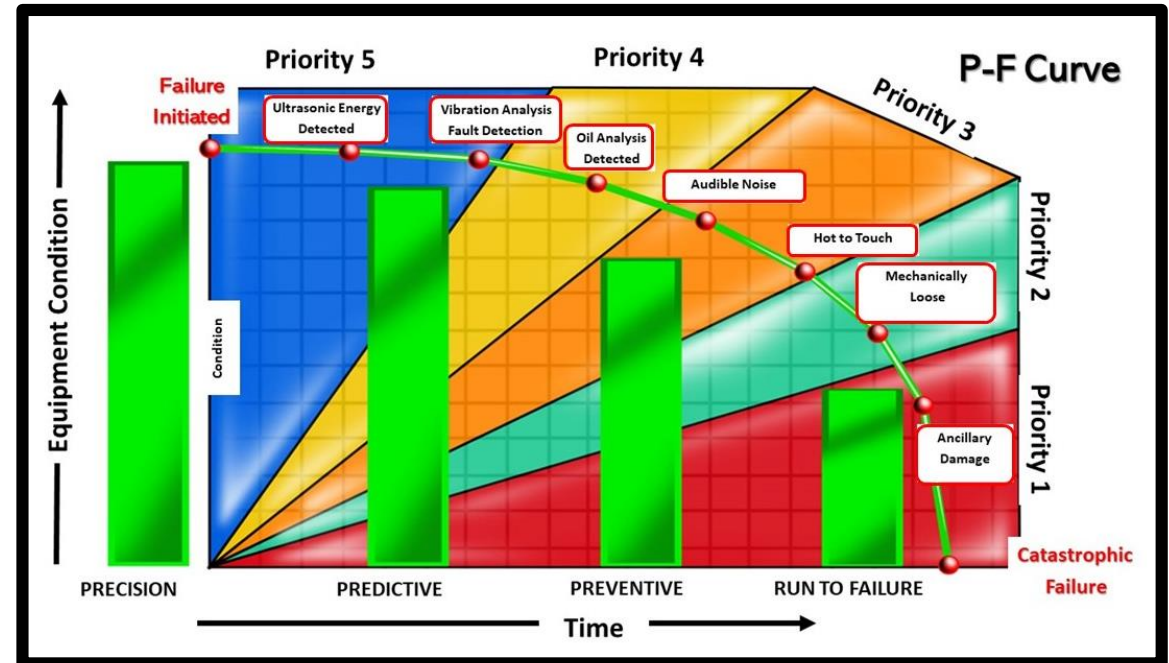| PM Eval Recommendation	# of Tasks	% of Total Tasks	Labor Hrs. Represented
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Replace with PdM

"Replace with PdM" means PdM can identify the defect early enough (see PF Curve) the replacement or restoration could be planned / scheduled / executed before full functional failure occurs.

Why have a PM which says "check motor" when a PdM Tech can "check motor" health far enough in advance will give you time to correct the problem (Planned and Schedule Correction).

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P-F Curve — Priority 5, Priority 4, Priority 3, Priority 2, Priority 1; Failure Initiated; Ultrasonic Energy Detected; Vibration Analysis Fault Detection; Oil Analysis Detected; Audible Noise; Hot to Touch; Mechanically Loose; Ancillary Damage; Catastrophic Failure; Equipment Condition vs Time; PRECISION, PREDICTIVE, PREVENTIVE, RUN TO FAILURE

Predictive Maintenance is an equipment maintenance strategy based on assessing the condition of an asset to determine the likelihood of failure and taking appropriate action to avoid failure. The condition of equipment can be measured using condition monitoring technologies, statistical process control, equipment performance indicators or through the use of human senses. (Source: SMRP Metrics)

Re-Write Task

"Re-Write Task" means the task need to be modifies. Example: Current - "Check Belt Drive" Future: "Inspect Belt Drive for deflection, wear, and tension"   (V-Belts should never be re-tensioned)

Ask yourself: "How will a Belt Drive Fail" – there is only a few reasons why a V-Belt Fails.

Sources of Drive Problems

- Rolling or prying on belts
- Misalignment
- Incorrect tension
- Improper handling of belts
- Mis-matched belts and/or pulley used
- Idler not taking tension up correctly
- Guard interference

- Sub-minimal diameters
- Under-designed drive
- Over-designed drive
- Excessive rim speed
- Incorrect belt type

Improper Belt Storage or Handling
- Temperature
- High Humidity
- Storing for too long
- Too near ozone generating equipment
- Exposed to sunlight

Defective Drive Components
- Check for worn pulleys or sheaves
- Check for cracked or weakened bracketry
- Check for weak mounting brackets
- Check for worn belts
- Check for nonfunctioning idlers
- Check for damaged guards

Poor Drive Design

Improper Belt or Pulley Installation

Environmental Factors

- Dust
- Debris
- Water/humidity
- Oil/grease
- Heat/cold
- Rust

Improper Drive Maintenance
- No retensioning
- Not replacing worn sheave
- Not cleaning guards
- Not checking for weak bracketry & drive components
- Not checking alignment
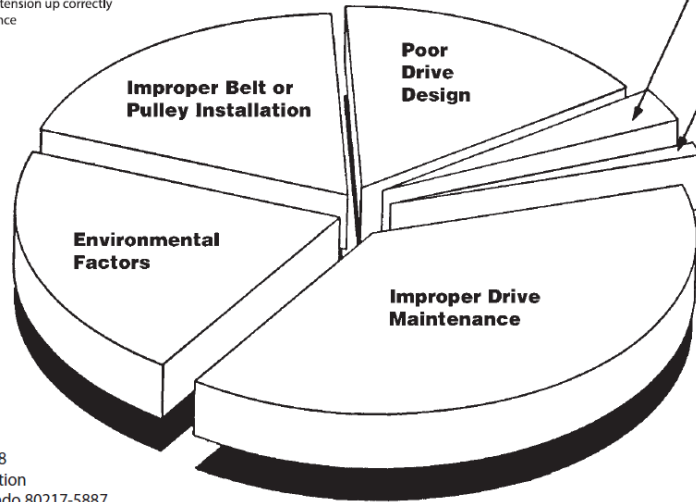
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Task is Good as Found

"Task Good as Found" is exactly what is says. The task is correct because it does either identify or mitigate a specific Failure Mode or Failure Modes.

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